Utah Automated Geographic Reference Center (AGRC)

More About Fields in ArcGIS 9:

1) FIELD DEFINITION

Field definition include the name, type, and constraint (length, precision, etc.) of the field. There are many reasons to pay very careful attention to field definition, both when planning your database schema and in the process of analysis and data management after the fields have been created. These reasons include the ensuring the desired range of values can be stored in the database and maximizing the ease of exporting, copying, appending, and converting features in individual and batch operations.

FIELD NAME

- If the data will ever be converted or exported to a shapefile, the field name should be no longer than 10 characters.
- First 10 characters should always be unique with respect to other field names in the table or feature class
- Should not start with a number or be a 'reserved' word (i.e. Type)
- Spaces are a bad idea for field names, file names, feature classes, folders, etc.
- Using all capital characters can add convenience

FIELD TYPE

Text - textual data - letters and/or numbers
- numbers cannot take part in calculations if they are stored in a Text field unless the VB conversion functions are used)
- rfieldtype also referred to as

Short Integer - integer numbers values between +/-32,767

Long Integer - integer numbers values between +/-2.16 billion

Float - real numbers (positive numbers) to a decimal precision of 7 places (7 significant digits)
(this field type is also referred to as **Single**)

Double - real numbers (positive numbers) to a decimal precision of 15 places (15 significant digits)

Date - stores dates (and or times)
- in geodatabases, this field can store the date and the time
- shapefiles and coverages canonly store the date portion
- date fields will display differently in different applications

BLOB - stores references to Binary Large OBjects like video, audio, word files, or other binary data

Other specialized Field Types: Rasters, Pictures, GUIDs (pGDB v.9.0)

LENGTH

- For text fields, this represents both the number of allowed characters and the display width
- For all other fields, refers only to the column display width in table view.

PRECISION

- For numeric data, precision is the total number of digits allowed (Left and Right of decimal point)

SCALE

- Number of allowable digits to the Right of the decimal point
- Only for Float and Double field types

Notes on Scale and Precision:

: - Precision and Scale do not need to be set. Setting the precision and scale can be useful as it constrains the data to the allowable precision and scale. Unless a constraint is desired, set precision and scale to 0 (no constraints on either side of the decimal)

- When you create float and double fields and specify a precision and scale, if you require precision is greater than 6, use a double; otherwise, use a float. If you create a double field and specify a precision of 6 or less, a float field is created in the database. If you create a float field and specify a precision greater than 6, a double field is created.

- If you specify a scale of 0 and a precision of 10 or less, you should be creating integer fields. When creating integer fields, your precision should be 10 or less, or your field may be created as double

- Interesting issue: when adding fields add a Float with a precision of 2 and you get a Short with Length = 2 and Precision = 2 (ArcCatalog is trying to help you with your decision).

2) ISSUES WITH LOADING & EXPORTING DATA

Using Simple Data Loader (SDL) in ArcCatalog (right click on Feature Class and select Load >> Load Data)

The SDL constrains the user to operations that will not lose or change data.

For example:

Integer can load into a field of type Double

Short Integer can load into a field of type Float

Source fields of type Double *cannot* load into target fields of type Float or Long or Short Integer

Here is the complete list of allowable SDL transfers:

		...can receive data from source fields of type:						
		short	long	float	double	text	date	blob
Target fields of type...	short	x				x		
	long	x	x	x		x		
	float	x	x	x		x		
	double	x	x	x	x	x		
	text	x	x	x	x	x		
	date					x	x	
	blob							x

Notes: The ArcCatalog SDL 'auto-magically' maps fields using field name without considering field type. This can cause problems. If Source field FieldA is of type Long Integer and Target field FieldA is of type Short Integer, the fields will map but the SDL will not allow the data to be transferred.

If you need to transfer data from one type to another and that transfer is not allowed in the SDL (ex: from double to long), there are two options. Option 1 involves this sequence: add temporary field to target dataset, use SDL to load (double into temporary double), then use ArcMap field calculator to calculate intended target field using the temporary field value, delete temporary field (if desired). Option 2: Write a VBA script that uses feature cursors and conversion functions together with a manual field mapping.

Exporting from Personal Geodatabase (PGDB) to Shapefile .SHP

When exporting to Shapefiles, all fields will keep their field type but precision and scale will likely be altered so that if the data is reloaded from shapefile back into PGDB format, the field definition will be different than the original. Blobs, Rasters, GUIDs & Pictures are not allowed in Shapefile format and will cause an error during export.